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CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. XIII MARCH, 1941 No. 3

Echinocereus dasyacanthus as published in Blanc's "Hints on Cactus" (1890). Courtesy Texas Cactus Gardens.

CACTUS AND SUCCULENT JOURNAL

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EDITOR'S NOTE

We are mailing the March JOURNAL earlier than usual because we want you to have the balance of the index for Vol. XII complete. In the center section you will find: (1) The last four pages of the index; and (2) The title page for *"Colorado Cacti;"* (the April and May issues will complete the monograph).

In the April JOURNAL we will publish our first series of articles advising amateurs how to start growing and collecting cacti and succulents. Share your knowledge and send in your advice NOW. See if we can prevent amateurs from making the mistakes that we have made.

Please suggest five cacti and five succulents that a beginner should experiment with. Then list 5 cacti and 5 succulents that one should have to hold one's interest. We will welcome from dealers suggestions for beginners' collections (two plants each of 10 kinds)—please quote prices in lots of 20 collections. We also want dealers' prices on 20 shipments of rooted Echinopsis (12 plants to each shipment); these will be used for experimentation and for competition in raising offsets. All shipments must be identical and must be shipped at one time.

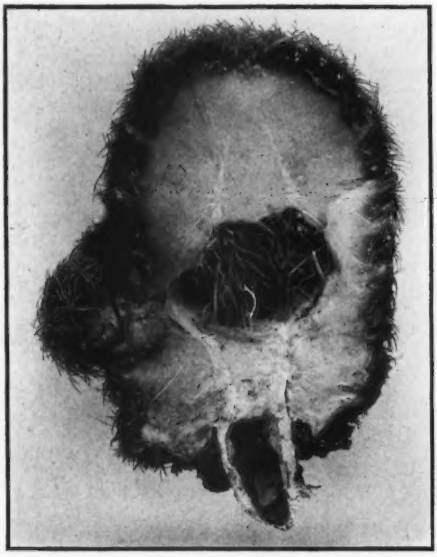
Here is a chance for a real constructive work and from this experiment a booklet will be published advising beginners just how to begin.

THE CACTUS AND SUCCULENT CLUB OF CHICAGO

A new project has been started in our club—namely a Club "Bulletin." We hope to continue monthly and to help any member by instructive articles, question and answer page, club news, and a copy of the lessons prepared by our national president Mr. Marshall. The nominal cost for the bulletin is 5c to our members, 10c to non-members. The Editors are Giosue S. D'Aston, Ph.D., F.C.S.S., and Mr. Frank Kranz.

The first issue consisted of 6 pages. One note of general interest was on the Cactus House at the Garfield Park Conservatory, which has undergone a much needed rehabilitation. Much of the plant material was lifted and replanted in new soil, more typical of desert conditions. Many new plants were added to the collection. According to Mr. William Blaesing, acting Chief Horticulturist, of the Chicago Park District, a collection of 75 Euphorbias is of special interest. This collection, consisting of 60 different species, was donated to the Park District by Mrs. Charles Tottle, of Los Angeles, Calif. One plant of *Euphorbia ingens,* is about 10 ft. high, and a remarkably fine specimen.

MRS. HARRY N. OSGOOD, *Corresponding Sec'y.*



Coryphantha recurvata (Engelm.) B. & R., with an abundant growth of roots formed within a cavity in the stem. The joint is about 4½ inches in diameter.

R. H. PEEBLES, Arizona.

AN APOLOGY

The color photograph of *Zygocactus truncatus* on the cover of the December JOURNAL was taken by Dr. Stephen Darling of Lawrence College, Appleton, Wisconsin. We regret that we were unable to make this notation last month.

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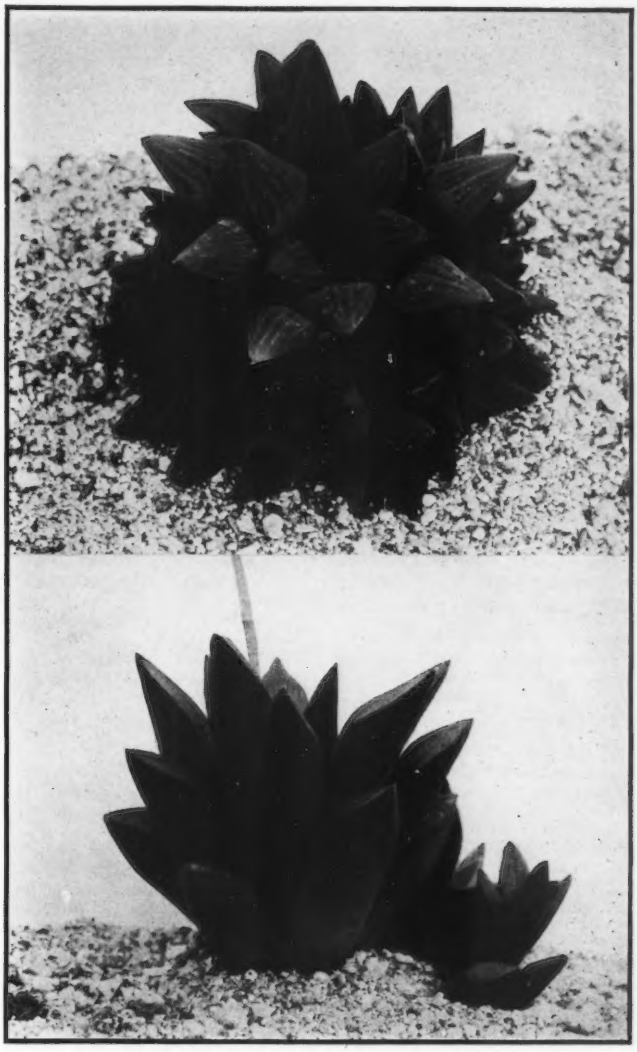

Haworthia turgida, Haw. var. *suberecta,* Poelln. nat. size.

Notes on Haworthias

By J. R. BROWN

Haworthia turgida, Haw. var. **suberecta,** Poelln. in Repert. Sp. Nov. XLV (1938) 134.

Differing from the type in its more erect and longer leaves and the back of the leaves without lighter flecks.

Locality: George, in the Karroo.

Having grown this plant for many years side by side with the type, little difference can be noted in the size of the leaf or other characters. Two photos of this var. of *Haworthia turgida* are shown, of plants grown outdoors, one shows the top view of a small cluster, the habit similar to that of the type. The other photo shows a side view of a plant with nearly all the offsets removed so that the erect shape of the leaves may be more easily seen, and while the var. may be a little larger than the type, the difference seems

to be very slight indeed.

While no lighter flecks are to be seen on the back of the leaves of the plant in photo., some flecks are to be found on the back of several leaves and this is undoubtedly a latent character which will become more pronounced under cultivated conditions.

The plant is at once distinct by its more erect leaves which are never recurved.

It flowers in So. California at the same time as the type, February to April.

This is the plant which Dr. von Poellnitz, in error, described as *Haworthia cuspidata,* Haw. in Repert. Sp. Nov. XLI (1937) 198.

GRAFTING COLUMN

A department conducted by Frank R. Mark, 825 Elyria Drive, Los Angeles. Mail him your problems.

GRAFTING PAYS DIVIDENDS

Since preparing the following paper on pests for our club, I have been investigating dichlorethylether for root mealies. It was recommended by Dr. Poindexter two years ago and more recently by Mr. Marshall. Although I only used it for the first time a week ago, I am sure that it is going to work. No other spray that I have used has been so penetrating, and on lifting a plant several days later I found that all bugs, even in the most protected places were dead. Mr. Marshall says to mix it at the rate of one ounce to five gallons of water and use when the soil is slightly damp. I find that it also kills top mealies and red spider. There is nothing about it that will stain the light colored plants, and it does not leave them oily or greasy. It is called Golden Lawn Moth Spray and is put out by the Nico-Dust Mfg. Co., 2412 E. 57th St., in Los Angeles. I wish someone who has had more experience with it would discuss it in the JOURNAL.

I hope the recent articles on grafting won't discourage others in learning how to graft. As I look over my collection I see a great many plants that I would not have if I didn't know how to graft. A whole set of beautifully spined Echinocereus are now beautiful clumps and almost hidden on their short stubby grafting stock. These were scions from some Texas plants that were too old to establish and would have been a total loss if I had not grafted them. (I wonder why the Oklahoma members do not graft their unusual colored flowering specimens. I recall that they lost all of those plants when they brought them in from their native localities). My favorite stock is a short thick piece of hybrid Cereus. Usually the plant clusters and hides the stock in a couple of years. If it does not, I take it off and root it. "Bloating" usually results when the scion has been grown to dry. This usually disappears in the second growing season, and the plant assumes its normal appearance.

Most people fail with grafted plants because they do not understand how to take care of them. I find that the hybrid Cereus resents having its roots disturbed while it is dormant. It shrivels so badly that it is wisest to regraft it in the spring. If part of the scion is left on the old stock, cutting it will retard the top growth long enough for the roots to re-establish and a nice cluster will result.

Grafted plants must have good soil and plenty of room for the roots to expand. It is suicide to cram them into small pots. They want warmth and plenty of water in summer; if this cannot be given, it is useless to bother with them. For a person like myself who hasn't the facilities or patience to mature a tiny seedling, it is the most satisfactory method of propagation. I have been grafting plants for eight years and I feel that everyone should learn how, as it comes in very handy even in a small collection of plants.

MRS. HARRY LEWIS, Wash.

QUESTIONS AND ANSWERS

Q. You mention the grafting of seedlings on Selenicereus! Could Opuntia be used, and if so, would it be best to cut the top off a large pad and graft the seedlings along it, or should they be wedge-grafted along the top of the pad? How large or old should the seedling scion be, and how much would the speed of growth be increased? After how long would Cereus seedlings be large enough to use as grafting stock for seedlings of the same age?

G. L., Minn.

A. *Selenicereus Macdonaldiae* is generally accepted among propagators as being the ideal stock on which to graft tiny seedlings for quick growth. Please do not misunderstand the purpose of this particular practice, however.

They are not usually considered permanent grafts at all, and for that reason they are put on the growing tip ends of the Selenicereus regardless of its length, shape or position. The main object is to bring the scion up to sufficient size as quickly as possible so that it may be re-grafted on permanent stock.

Opuntia pads may be used but I would say as *second choice,* and you will find that certain sepcies, such as milky Mammillarias, will not do well on them.

Wedge grafting is not necessary on small seedlings, flat grafts are more convenient to make and are equally satisfactory.

The age of the seedling scion is immaterial and the size required is a matter of opinion. The size of a lead pencil in diameter is very convenient to use, but smaller ones may be used with equal success.

The increased speed of growth due to grafting cannot be stated definitely, but one can reasonably expect it to be at least doubled or trebled, under favorable conditions.

There seems to be a great deal of difference of opinion as to when Cereus seedlings are "large enough to use as grafting stock." Rooted Cereus cuttings, while more expensive, are preferable for many reasons. They do not have that weak, top-heavy appearance so noticeable in seedlings and they may be selected as to both height and diameter so that the entire plant will look symmetrical when the scion has reached its maximum growth.

Most Cereus seedlings have tap roots which are better for outdoor planting, while cuttings develop a multiplicity of small roots which makes them more adaptable to pot culture.

The "top heavy" trouble may be corrected by cutting seedlings off just above the ground level when about 5 or 6 inches high and re-rooting them; they will then be more substantial for grafting purposes and many feel that the new root system will be better for pot culture.

Whether seedlings or cuttings are used, it is merely a matter of opinion as to the size to be used. Most propagators will agree, however, on the well known rule of "the larger the better." I would suggest that you consider the size that the scion will be when full grown, so that the entire plant will be in proportion. Also, look up pictures of grafted plants in the back numbers of the JOURNAL, some of which will give you ideas of how grafted plants should and should not look.

THE ACTIVE PRINCIPLES OF VARIOUS CACTI

Inasmuch as I am a physician, the action of the various alkaloids and other active principles found in cacti has intrigued me considerably. Finally, under the whip of curiosity, I undertook to investigate medical literature to determine the action of these agents. Although a completely exhaustive study has not yet been made, sufficient material has been accumulated to correct several widely held misconceptions. Unfortunately, this reveals no important use for any of these substances, either in medicine or the trades. Nevertheless, a true record is worthwhile even though of negative value.

Today there is only one compound obtained from the cactus family, which can claim widespread use, and that use is rapidly disappearing. This substance is Cactin (or Cactine). Chemically, it is a glucoside obtained from the green stalks of *Selenicereus grandiflorus*. It was originally described in 1864 by Rubini as a "heart tonic." It was thought to stimulate the vasomotor centers of the brain and to increase the strength of contractions of the heart muscle. For that reason it was combined in amounts of 1/60 of a grain with morphine and scopolamine to prevent the possible depressant effects of these substances on the heart and blood vessels. Although two well-known medical dictionaries still ascribe this action to the drug, the United States Pharmacopoeia states that the drug probably is inert. No articles can be found in the past ten years describing any impartial physiological experiments with the drug. Sollmann, however, states that it was once believed to be similar to digitalis in its action, but recent work definitely proves it to be of no salutory effect. Four groups of workers, Hatcher in 1907, Matthews in 1908, Lyon in 1910, and Hatcher and Bailey in 1911, showed that even enormous doses of the best known preparations were practically inert in both experimental animals and in man. Lastly, the Council on Pharmacy and Chemistry of the American Medical Association in 1910 published an entirely negative report on the drug.

As one wanders through the pharmacological and medical literature, he discovers other substances derived from cacti which, although of no more value medically at present, have, at least, powerful, physiological effects. A group of alkaloids with narcotic properties has been isolated from *Lophophora Williamsii*. The crude drug extracted from this plant is called Anhalonium. This is the substance used by the various tribes of the Southwestern United States and Mexico during their snake dances, and other religious rites. Blair, in 1912, claimed that they were also using it as a habit-forming narcotic. From this crude substance four alkaloids have been isolated which are similar to each other in their physiological effects.

These effects are quite numerous. There is a slowing of the heart rate with a definite depression of the respiratory centers in the brain comparable to the effect of morphine. The skeletal muscles of the body are slowly paralyzed, apparently from a direct action on the nerve-muscle junctions, comparable to the way Curare acts. This is usually accompanied by a loss of coordination of muscular action.

The most interesting effects of the drug are those due to stimulation of the higher centers of the brain, particularly the light perception and sight-coordinating centers. There is a rapidly, ever-changing flashing of brilliant colors and tints. At times when large doses are consumed there may also be similar auditory and olfactory hallucinations.

All the four specific alkaloids responsible for these weird effects are known chemically. The delusions of color and other symptoms of cerebral stimulation are due to Mezcaline, a highly active, colorless alkaline oil. It has the formula; $C_{11}H_{17}NO_3$. Anhalonine, $C_{12}H_{15}NO_3$, has the same physical properties as Mezcaline but its physiological effects are limited mostly to the heart and the centers of blood vessel and breathing control in the brain. The general effect is to slow the heart and to raise the blood pressure. However, large doses depress these centers and there may be a drop in blood pressure, and a dangerous lowering of the respiratory rate. The other two alkaloids are similar in their effect to Anhalonine. They are Anhalanine, $C_{11}H_{15}NO_3$, and Anhaline which is identical with Hordenine.

In addition to the above well described alkaloid, there are also others found in other cacti. None of them are well known, nor have they been investigated in the physiological laboratory. From what little is known, it would seem that their medical uses would be of extremely limited value and far inferior to other well-known drugs in common use. The two most active cactus alkaloids, Anhalonine and Mezcaline, which are described above, might have found use if there were not other substances so far superior that they completely supersede them. Digitalis, quinidine, strychnine and the opium series of alkaloids produce all the beneficial actions attributed to the cactus alkaloids without the harmful effects. As laboratory investigation progresses, some day other active principles may be isolated from cacti which will prove of value. Until then, the cactophile must be content to base his interest on the exotic fascination of the plants themselves. For me that is quite sufficient.

CHESTER B. ALEN, JR., M.D.

CHEMICAL CACTI CULTURE

Antioch, March 27, 1940.

In the President's Message in the CACTUS JOURNAL you asked who had tried Vitamin B-1. Here are some of my findings in the use of this Vitamin. I have potted seedling Mammillarias, two of each kind, one of each variety was given Vitamin B-1. Every week the other plant was given the same soil as the treated ones. I took care to select plants of the same size and development so I could check any difference. After a few months I could see a decided difference in the treated plants; they are larger and more plump than the untreated ones.

The difference is decided in the Astrophytums. On December 7, I got cuts from choice Epiphyllums and left them in the sun to dry for three days, after which I placed the cuts in a solution of one drop of stock Vitamin solution to one pint of water. I left them in there for 10 minutes, after which I put them in a rooting medium of equal parts of sand and peat. Three months later the plants had a new growth of from 6 to 12 inches. The new shoots are much stronger than those from cuttings. The three-month-old plants look like one-year-olds.

I have found that newly transplanted or repotted plants do not stop growing, if watered with a Vitamin solution of 1 drop stock solution to a pint of water. I had some plants in a seed flat that were infested with root aphis. I washed off every particle of soil and disinfected them. After this I repotted them and watered them with the above solution of Vitamin B-1. The plants kept growing as if nothing had happened.

I get a lot of pleasure out of growing seedlings and I give my seedlings Vitamin B-1 from the time they come up. They make a wonderful root system under the treatment. I have started to give Vitamin to the other plants in my collection but it is too early to see results as I did my experiments with only about 30 plants.

If the weather is dry, I water them with Vitamin and the next time with water. I do not give two Vitamin waterings in a row. For my regular watering I use one drop stock solution to 1 gallon of water. I hope that my little experiments will be of interest and useful.

I showed my Phyllos at our last meeting of the Cactus and Succulent League members and they were amazed.

G. W. VAN DER BUNDT, Antioch, Calif.

MY EXPERIENCES WITH VITAMIN B-1

For the last several months I have been making rather extensive experiments with the new Vitamin B-1 and since some of you may be interested in using this product I will give you an account of some of my results.

About the first of February my employer handed me a small bottle labeled Vitamin B-1, telling me to use it according to directions and also to make any other experiments I could figure out and to keep track of the results. That was the way my interest was aroused. Immediately I began studying everything I could find about Vitamin B-1 and I also began experiments at home on my own plants.

In all experiments I have made comparative tests by working at least two plants or two flats under such experiment—one with Vitamin B-1, and the other as a control growing normally so as to give me a good check on the results.

In my study I learned that when a plant forms its own chemical substance to influence its growth it is called a plant hormone. But to man, unable to manufacture this particular substance naturally, it is a vitamin. The distinction lies in the point of origin of the substance.

From my experiments it appears that there is a limit to the amount of B-1 that is needed by most plants and any amount above this seems to be wasted.

As regards the use of Vitamin B-1, I would say that it is impossible to lay down a hard and fast rule for the number of treatments and how far apart they must be, as each different group of plants may require just a little different treatment than the last. The only way to be sure is to work slowly until you can see some kind of result, then proceed accordingly.

I have tried several different kinds of B-1, and have found best results with the powdered B-1, manufactured and sold by Geo. C. Warner of Pasadena, or the tablet form sold under the name of Wrights B-1.

Most of our succulent plants do not seem to be able to supply as much vitamin as is needed, so that addition of B-1 usually helps to build a stronger root system but in cacti you do not always notice any exceptional growth from use of this vitamin.

In our other succulents, especially Haworthias, Aloes, Gasterias and many of the other leafy types, you can see an almost immediate increase in growth after the first few applications. Haworthias are noted for losing their roots easily but after treatments with B-1 they seem to build and keep a much stronger set of roots.

My results with cacti have not been startling, although one rather strong point has developed while treating some plants in my own collection. Plants of the genus *Gymnocalycium*, while not showing exceptional growth, have produced three or four times as many flowers as plants of the same species not treated.

As many of you know, most of our succulent plants have a more or less definite dormant period, at which time the plant wants to be allowed to rest until it has regained some of the strength lost during its flowering period. By applying B-1 to the plant it can be made to grow and sometimes continue to flower throughout the time it would normally be resting, although this is not recommended, as such treatment often proves fatal to the plant. As an illustration of this statement you can see definite proof of these facts in some of my Rhipsalis, which I kept growing and in some cases flowering until our recent Cactus Show (June 16) and which I have since allowed to go to rest. These plants would have normally been resting at the time of the show, as most of them are at their best in the late fall to early spring.

I know that many of you saw the recent Cactus and Succulent Show given by the Southwest Cactus Growers and possibly some of you may remember the Sedum display. This display is another very good example of the good effects of B-1 on some of our succulent plants. When that setup was planted, the cuttings used were only about one inch long and in the four or five weeks from planting to show, many of the plants grew so much that Mrs. Rush figuratively had to give the display a hair-cut after getting it set up in the show.

I have also used B-1 on Echeverias and while I have obtained exceptional growth on established plants, I have had no special results in producing roots on cuttings.

Other plants treated with Vitamin B-1 and closely checked were, *Espostoa lanata, Haworthia setata, Mammillaria bocasana, Aloe variegata, Crassula hemispherica, Rochea falcata, Cleistocactus Strausii* and

Cephalocereus senilis. These experiments are still in progress and results are still uncertain, although very good results are being found in most of these species.

Throughout this talk you may have noticed I referred often to the fact that B-1 used alone does not give startling results in forming roots on cuttings. For best results, the cuttings should be given a treatment of Indole Acetic Acid before Vitamin B-1 is used.

This treatment being entirely different and calling for quite a little explaining, I will not try to go into it today.

Root shock in transplanting has been another bugaboo of the succulent grower, especially with the leafy types. B-1 has also solved this problem, for by treating the plant both before and after transplanting, you can notice no bad effects from the moving in practically all cases.

Another point that I failed to mention is that Vitamin B-1 reacts differently in different types of soil, so that experimentation becomes practically a necessity before best results may be obtained.

HOMER RUSH, Los Angeles.

VITAMIN B_1

By GEORGE C. WARNER

(Vitamin B_1, Hydrochloride. Thiamin Chloride)

For Use in the Treatment of Cuttings, Transplantings, and Growing Plants in General

Vitamin B_1 is one of the necessary factors in the normal growth of plants, one of its functions being to increase or stimulate root growth. (Vitamin B_1 is not a fertilizer and wil not take the place of fertilizers.) At first one was led to assume that the formation and accumulation of the vitamins in plants, such as fruits and vegetables, was for the benefit of mankind, but it is now known that they are also just as necessary to the normal functions of plant life as in human life.

The Vitamin B_1 used is a synthetic preparation that contains only Vitamin B_1. By using any other source such as extracts from rice polishings or yeast there is some danger of bacterial contamination as well as the introduction of traces of compounds which may inhibit or retard plant growth, hence doing more harm than good.

Some of the uses of Vitamin B_1 are (1) for treatment of cuttings, (2) when transplanting any plant, shrub or tree, (3) for plants that are slow growing, and those that are not growing properly (due to poor root system).

Some plants are very poor producers of Vitamin B_1 (such as Camellias), or have inadequate root systems, therefore being below their normal growth rate, they will respond to application of Vitamin B_1.

Feeding plants Vitamin B_1 is a very simple procedure and offers many advantages to the users. It is added to the water and applied in an ordinary watering either by ditch, basin, sprinkling, or otherwise. In general Vitamin B_1 should not be added to the water more than once a week.

In the treatment of cuttings it can be applied in two ways, either by standing the base of the cuttings in a solution of Vitamin B_1 for 24 hours or by sprinkling heavily enough to get to the base of cuttings once a week.

In transplanting any plant even from a seedling to a full grown tree, if watered in with Vitamin B_1 it will do away with a large portion of setback and loss due to root injury, and adjustment to the new environment.

In the case of slow growing plants and those going back instead of ahead, often the results will be marked. However, a certain number of plants will not respond to Vitamin B_1 as it is only one of the substances necessary for plant growth. In some cases you will see a difference after a few days, while in other cases it may take several weeks for the difference to become apparent, as the root system is built up before there is a change in top growth.

HORMONES

We read so much these days about the treament of cuttings and seeds with one of the now very many auxines for the encouragement of root action on the difficult subjects. I have not yet seen any note of its use for the cacti or succulents proper. We had in our cutting bench a set of sprouts of *Euphorbia abyssinica* taken off a huge tree when beheaded to check its height. These cuts were in for a year at least before some rooted. There were three left at the age of eighteen months in the bed. Rather discouraging, so one day when using this Hormone powder on other subjects, some was applied to the Euphorbias and in about three weeks, signs of root action were seen at the tips of the pieces, and, sure enough there were roots in plenty. Having tried the liquid root stimulants with poor success—it needs a druggist to decipher the ccc'c before using, and even then there is the factor of the subject one is dealing with as to bark resistance and timing—I find the powder preparation seems to be fool-proof and its success on an eighteen months' old cutting so quickly should be of interest enough to others, so we tell it as happening in late autumn when sun heat was waning.

E. O. ORPET.

FROM HERBERT G. O'MEARA, INDIANA

Referring to the article in the CACTUS JOURNAL regarding the use of root developing solutions would say that I have had very much better success when using a powder called "Rootone." As this does away with the prolonged soaking it seems especially adaptable for use with cacti and succulents.

VITAMIN B-1 FOR PLANTS

By DR. E. CARMICHAEL

(Madison Cooper's Magazine)

Of late we have read a great deal about the wonder-work wrought by feeding Vitamin B-1 to plants. This is also in the experimental stage. That it is still experimental is shown by reports ranging from brilliant success to abject failure from its use. In short, proper conditions for success have not yet been established.

Why should Vitamin B-1 be used? Vitamins are normally manufactured in the leaves of plants. They, with starches, acids, enzymes and other substances are formed from the elements of water, air and soil. Vitamin B-1 is the "Growth Vitamin,"—the one that stimulates growth in animals and plants. It is not a food, but acts as a *catalyzer,* a substance that changes the velocity of a chemical reaction, that whips up the process of food formation in the leaves of plants. The extra plant food formed goes down to the roots, increases their growth and size, they take in more food and water from the soil and the stalk, stems, and leaves of the plant, all grow larger. In short, feeding with Vitamin B-1 makes it possible for a sickly plant to better use the plant food with which it comes in contact.

Being a catalyzer, it should be used in minute quantities. It is unbelievable but true that a solution as dilute as 1 to 100,000,000 parts of water makes the difference between a sickly and a healthy plant. Well,

we didn't believe it either but we tried it and it works. But other conditions must be right.

There are reports of failures. This may possibly be explained on the grounds that the soil was full of humus of leaves of grasses and trees containing natural Vitamin, so that added had no further effect. This may account for reports from greenhouse men who saw no improvement from use of Vitamin B-1. It also explains why the dahlias of my neighbor grew 12 feet high. He had used an abundance of barnyard manure rich in nitrogen and natural Vitamin B-1. Remember, Vitamins are not all the requirements of a vigorous plant. It also needs light, air, proper food and water.

Vitamin B-1 is a new plaything. Let's work with it on an experimental basis. Follow no one; but blaze a trail in the forest of the unknown and see what discoveries YOU can make.

We haven't tried this, but a bouquet of flowers should stay fresh longer in this solution than anything we have tried. A coleus slip taken from a plant treated the day before with Vitamin B-1 and left out of water at room temperature remained crisp and fresh for thirteen hours. Try it and report. A slip from an untreated coleus plant wilted in less than half an hour. When summer comes water one plant with B-1 and another like it with plain water every week, then water both with plain water in between and see which does better.

I placed two red roses in a solution of Vitamin B-1; two in hydrochloric acid, 1 part to 1500 parts water; and two in plain water as a control. Those in the Vitamin solution soon turned somewhat darker, but wilted first; those in the acid solution wilted next, and those in plain water last. Seven to twelve drops of pure hydrochloric acid to 1 quart of water will keep some blooms fresh twice as long as plain water, notably carnations and peonies; others not.

Belated reasoning told me that vitamins work in the leaves of plants where the available plant food is formed, hence the bloom does not need any more of them. In this trial they seemed to act as a poison and hurried decay of the bloom.

Our experiments were only recently started but results are already showing. An ivy had stopped growth for a year. The roots were washed and soaked in the stronger solution for 15 minutes and planted back in the same soil and now several new buds are coming out. Long stem, big-leaf begonias were brought back to activity in the same way. Coleus plants all have thicker stalks, larger and more vividly colored leaves and many side branches. Begonia leaves are waxier and more perfect. Begonias were transplanted, didn't drop any flowers or leaves and didn't wilt. Flowers of African violets don't drop off but hang on till they dry up.

Vitamin B-1 comes in pure powder, tablets, and solutions, ready to add to water. Follow directions accompanying package and don't use too much when a little does the work. And don't condemn it until you have applied it four or five times, since results don't show much before three weeks. But try it!

One point should have been mentioned, namely, Vitamin B-1 will likely work better in neutral or slightly acid soil, for chemical reasons.

FROM PEABODY, MASSACHUSETTS

A neighbor was given a pad of an Opuntia, and after five weeks it had not rooted. I asked him to let me try to root it. I put it in a small pot of coarse sand and watered it with B-1 solution. I kept the sand damp with B-1 solution, then clear water, then B-1, etc., and in less than a week it had strong roots. The same resulted when I started new plants from *Aloe arborescens*. A pad of *Opuntia littoralis* also struck roots in a little more than a week. I also used B-1 solution after repotting two Gasterias. Before repotting, their leaves were very thin; since then they have grown longer, wider and thicker, and *Gasteria maculata* last week had four new plantlets around the base. *Haworthia fasciata* had five young plants round the base, four of which I cut off to root. I used sand, loam and peat to pot them; after planting I set the pots in B-1 solution till the top of the ground was damp. After three weeks, the 2½ inch pots are pretty well filled with roots and the plants are looking better than ever. I will try B-1 on some of my other plants later on and see what happens.

MRS. C. N. NICKOLAUS.

FROM DR. W. MORGAN, RICHMOND, CALIF.

For some time I have been experimenting with a new dry rooting hormone. It has proved very satisfactory and I can highly recommend it. In addition to stimulating rooting it also prevents and stops decay.

COMMON NAMES

From *The American Botanist*

Ever since that episode in the Garden of Eden, the question of what to call the plants has puzzled mankind. Not only do the names first given to the plants bother him, but even the names of the groups to which they belong are still unsettled. The terms in Latin or Greek which we assume to be the true names, are called scientific names, or botanical names. The equivalents in our everyday language are usually known as common names—even the most uncommon of them. In the early days of botany, almost before the scientific names consisted of two terms, the second term was called the epithet or the trivial name. This was seldom adopted by the common people and did not fit the necessity anyway. The names commonly used were then called country names, or folk names. Later they were called popular names, or names made by the populace, but were often far from popular. When the lore of plants became more widely diffused among the people the names were called vulgar names, meaning simply common names. Since names of this type were often uncommon they came to be known as vernacular names; that is, names in the native tongue. This is an especially appropriate term since a species may grow in a number of foreign countries with different names in each. Not until the beginning of the present century did some ambitious individual originate the idea of translating the technical names into English, thus giving rise to some horrendous examples called English names. This also gave sentimental and poetic individuals a chance to foist a lot of nonsense on the public. Through all these changes the growers of plants adhered, pretty well, to common usage, but they have always had a number of names of their own concoction, many of which differed with the locality and thus hampered business. To remedy this the nurserymen have now established a "standard" name for each species to the exclusion of all others, but this attempt at regimenting the names can scarcely succeed, because no man, even the youngest of us, can make a plant name common or decide which name we shall individually use. As a matter of fact, the first attempt of this kind has already resulted in a revision of the standard and a changing standard is standard in name only. It is indeed highly desirable that all plants that are bought and sold have one unchanging name that, regardless of the findings of science, shall not be subject to revision. This might well be called a trade name, but as to the possibility of making this the final word in plant names, one might review such attempts for the last six thousand years and draw his own conclusions.

Photo of a corner of the late Col. Kewen's garden, showing: *Aloe spinosissima, A. mitriformis, Cotyledon orbiculata, Dudleya Anthonyi, Echeveria metallica, Crassula arborescens, Sedum pachyphyllum, Euphorbia coerulescens, E. grandidens,* and *Aeonium* species. Do you know these plants? Photo by J. R. BROWN.

PERCENTAGE OF GROWTH AND GERMINATION

By MORITANE MEGATA
Secretary of the Cactus and Succulent Society of Japan

The choice of title for this article may cause some controversy because of the fact that the conclusions in the article are based on the results from only 6868 seeds, which is not enough to be a real test. It may, however, inspire some large grower to give figures on the results obtained when a great number of seeds are sown and it certainly will provide subject matter for thought.

From 1934 to 1939 I have sown 6868 seeds of about 212 species in 40 genera of cacti and other succulents. I have grown most of the plants and recorded my observations and from this data I have compiled the following table to show: first, the genera easiest to germinate and grow; and second, that fresh seeds from my own plants or those of my fellow collectors here in Japan germinate better than the seeds I have imported.

*In column 3 the symbols are: "Gath."—seeds gathered by me, "Jap."—seeds gathered in Japan, "Imp."—imported seeds.

CACTI

Genus	*Sown*	*From* *	*Species*	*Number Seeds*	*Germinated*	*Grown*	*Percent of Germination*	*Percent of plants*
Ariocarpus	1936	Imp.	1	15	0	0	0	0
Astrophytum	1934	Imp.	1	8	0	0	0	0
Astrophytum	1935	Jap.	24	163	81	32	49.6	19.6
Astrophytum	1936	Jap.	9	325	253	63	77.7	19.4
Astrophytum	1937	Jap.	2	47	2	0	4.3	0
Cephalocereus	1935	Imp.	2	60	1	0	1.7	0
Echinopsis	1935	Imp.	2	60	0	0	0	0
Mammillaria	1934	Imp.	1	22	8	0	27.5	0
Ferocactus	1934	Imp.	2	70	17	2	24.2	2.8
Ferocactus	1935	Imp.	1	18	16	11	89.0	61.0
Frailea	1934	Gath.	2	188	156	—	83.6	—
Gymnocalycium	1935	Imp.	1	35	3	0	8.6	0
Hamatocactus	1934	Imp.	1	24	22	0	92.0	0
Mellocactus	1936	Imp.	3	254	75	33	29.6	13.0
Notocactus	1936	Gath.	2	132	26	22	19.7	16.7
Pilocereus	1935	Imp.	1	25	0	0	0	0
Pyrrocactus	1935	Imp.	1	35	15	2	42.9	5.7
Strombocactus	1937	Jap.	2	24	1	1	4.8	4.8
Thelocactus	1934	Imp.	1	19	1	0	5.3	0
Thelocactus	1935	Imp.	1	13	0	0	0	0
Trichocereus	1935	Imp.	1	45	4	3	16.0	12.0
			SUCCULENTS					
Aloe	1934	Imp.	1	6	1	1	16.7	16.7
Aloe	1936	Jap.	1	2	1	0	50.	00.
Aloe	1937	Imp.	23	101	5	4	4.9	4.
Aloe	1939	Imp.	?	73	14	8	19.2	9.
Gasteria	1939	Imp.		74	8	4	10.8	5.4
Haworthia	1939	Imp.		67	16	6	23.8	9.
Argyroderma	1936	Jap.	1	7	6	2	85.6	28.6
Argyroderma	1937	Jap.	1	6	4	3	66.6	50.0
Cheridopsis	1937	Imp.	7	(2210)	(1090)	—	49.3	—
Dintheranthus	1934	Imp.	1	19	0	0	0	0
Dintheranthus	1936	Imp.	1	13	7	0	53.9	0
Faucaria	1937	Imp.	1	17	2	1	11.8	5.9
Faucaria	1938	Imp.	4	63	33	14	52.3	22.2
Gibbaeum	1936	Imp.	1	7	3	0	43.0	0
Lithops	1934	Imp.	1	13	5	0	38.4	0
Lithops	1935	Jap.	7	43	27	11	62.9	25.6
Lithops	1937	Jap.	6	195	160	3	82.2	1.5
Pleiospilos	1934	Imp.	2	19	12	3	63.2	15.8
Rimaria	1935	Imp.	1	5	2	0	40.0	0
Titanopsis	1936	Jap.	1	5	4	1	80.0	20.0
Titanopsis	1937	Gath.	1	4	0	0	0	0
Titanopsis	1938	Gath.	1	40	14	3	35.0	7.3
Anacampseros	1939	Imp.	?	(100)	3	0	(3.0)	0
Caralluma	1939	Imp.	30	581	0	0	0	0
Hoodiopsis	1939	Imp.	1	41	0	0	0	0
Stapelia	1939	Imp.	31	683	0	0	0	0
Trichocaulon	1939	Imp.	14	288	0	0	0	0
Adromischus	1939	Imp.	1	27	0	0	0	0
Eeonium	1936	Jap.	1	20	0	0	0	0
Aeonium	1939	Imp.	1	33	1	0	3.0	0
Aichryson	1939	Imp.	1	21	0	0	0	0
Cotyledon	1939	Imp.	1	25	0	0	0	0
Cotyledon	1939	Imp.	?	(100)	0	0	0	0
Crassula	1939	Imp.	?	(100)	6	0	(6.0)	0
Euphorbia	1936	Jap.	1	4	1	1	25.0	25.0
Euphorbia	1937	Gath.	1	5	4	4	80.0	80.0
Euphorbia	1937	Jap.	5	45	25	14	56.5	31.0
Euphorbia	1938	Jap.	?	55	23	6	41.8	10.9
Euphorbia	1939	Imp.	4	64	1	0	1.6	0
TOTAL: 40 genera	(1934-9)		213	6868	2320	357	34.8	7.7

As shown by this table, I have grown many beautiful plants from seeds of Cacti and Mesembryanthemums and a lesser proportion of Euphorbias and Aloes. I have had much less success with Stapelias and the Crassulaceae. Admitting my inexperience in seed growing, these figures still

compare favorably with the comments of John T. Furchner in the September, 1939, JOURNAL.

This table also seems to indicate that imported seeds are inferior to home grown in germination. This does not reflect on the quality of imported seeds but seems to indicate that seeds lose much in shipment. The opinion here is that seeds must be kept in a cool, dry place.

What has been the American experience with seed germination? Do imported seeds germinate as well as those collected in the local collections? Which seeds show the best results: home collected, imported from Germany, imported from Mexico or South America? Answers to these questions would be most valuable.

The culture of seedlings is most important to all of us as in this way only can we breed hybrids, check validity of new species and introduce to our collections the many plants that are too tender to stand shipment from remote districts.

It is said "Nothing comes out of nothing." I would say, "Sow, grow, record and publish."

FROM NEW MEXICO

The *Journal* and *Cactus for the Amateur* have added much to my enjoyment of the most interesting hobby I have ever had. It seems remarkable to me now that I could have delayed so long in taking up this hobby. These wonderful plants grow at my very door, but it took stern necessity and a million Opuntia blossoms to make me cactus conscious.

I had spent seven years in vain effort to beautify the grounds around my home and my place of business with flowers. I had tried all the old favorites and many new ones; I had worked like a slave, spent more money than I could afford, and I shudder to think of the precious water I had used. I took stock of my reward. I had a few delphinums, withered and dying; some four-year-old columbines that had never bloomed, because the heat came so early their blooming season was over before it began; several other varieties, their flowers blasted by the scorching sun.

While my gardening failure was depressing me, I went on a picnic with some friends into the foothills of the Tres Hermanas Mountains about thirty miles from Deming. Opuntias were in bloom. I had seen cactus flowers before, of course, but never in such profusion. The whole landscape was like a big cactus garden, and it was simply blazing with color. The tall *Opuntia arborescens* was covered with purple blossoms as big as teacups, and the flat-stemmed Opuntias beggared description. If there is any shade of yellow, orange, and peach that they failed to display in their thick waxy petals, I didn't miss it. And this section of the country had not had a drop of rain in months.

There were other kinds of cacti, too, all looking as if they had been thoughtfully arranged among the boulders, along the ledges on the hillside, and on the grassy flats. *Ferocactus wislizeni* was plentiful in every size from flat round babies to 600-pound giants. One unusual specimen had three perfect heads coming from a single base and standing at least four feet tall. The ECHINOCEREANAE was well represented. Dainty snow white *Mammillaria grahamii* peeped out from sheltered places. On the grassy flats with *Coryphantha neomexicana, Coryphantha echina and Echinomastus intertextus,* we found *Coryphantha robustispina,* which I later learned was somewhat rare. There was an occasional *Opuntia leptocaulis,* still retaining a few red berries from last year, many tall Ocotillos, and other desert plants.

That night I went home full of cactus thorns and contentment, and with me went every cactus I could pile on the car.

While I was having a bed prepared for my collection, an *Echinocereus fendleri* bloomed—with its poor roots exposed to the sun—a gorgeous lavender blossom more beautiful than anything I could have coaxed from my garden favorites with extra special care and water enough to float a battleship. And from that time on until late October I was not without flowers in my cactus bed. Many of my neighbors who had lived in New Mexico all their lives came to exclaim at their beauty, and to say they had never seen this kind or that kind before.

In order to have company on my collecting trips, I proceeded to interest two young friends, Ira and Harriet Kerns, in my hobby. At first they thought I had lost my mind, but later became as enthusiastic as I. During the summer, every day that we could spare from our jobs of making a living, we spent hunting "new ones." And what a thrill when we found a kind we had not seen before and added it to our collection!

To those who might envy us let me say that there are two sides to this cactus-collecting business. Carrying twenty-five to fifty pounds of cactus five or six miles up one side of a mountain and down the other on a hot day is *not* pure joy. Nor did I find it pleasant sliding down the almost perpendicular face of a cliff on the seat of my overalls, landing with one arm impaled on the barbed thorn of an *Agave neo-mexicana,* and later having the thorn hacked out with a dull pocket knife. I could write volumes about the seamy side of cactus collecting, but I still love it.

Early in my experience with cacti, I began to worry because I didn't know the correct name of a single one of them. My first help along this line came from Mr. J. H. Leasure of El Paso, Texas. His little book, *The Story of Cactus,* is invaluable to amateur collectors in this part of the country, as he describes and names so many of our native plants. Then from Mrs. Lewis' article in a back number of *Better Homes and Gardens,* I learned about the *Journal.* I sent for it at once and for *Cacti for the Amateur.* Besides helping me with names and a variety of other helps, these opened a tempting new vista for me—succulents and the cacti of other countries.

I had a few succulents, and managed to exchange some of my desert collected cacti for a few more. In October I had my only south window enlarged to hold my succulents. After they were placed, I had quite a space left, so I sent to Knickerbocker Nursery for the thirty-two seedlings they advertise. These proved to be perfect little darlings, but they have me worried. The consensus of opinion seems to be that cacti should be kept as dormant as possible in winter, and these tiny rascals are growing like weeds. A wee *Mammillaria elongata minima* is growing a branch, and the hairy ones are sporting new scalplocks. Yes, forgive me, with all advice to the contrary, I water them. I just couldn't refuse a thirsty baby a drink.

This letter is the result of your request for letters to tell how collections were started and my own unbounded enthusiasm. If you care to use it or any part of it in "our" magazine, I'll feel honored.

Thanking you for the help and the pleasure the *Journal* has given me, I am

EUNICE BULLINGTON, Deming, New Mexico.

A Treatise on the Culture of the Dahlia and Cactus

By E. SAYERT, Boston, 1839

(From the library of W. T. M.)

PREFACE

The general desire manifested by the lovers of choice flowers to improve the beautiful tribes of the DAHLIA and CACTUS, has induced the writer to compile this little treatise. He does not pretend that the following pages are entirely original; he acknowledges his obligations to the late works of Paxton and M'Intosh, two of the most eminent floriculturists in Great Britain. So far, however, as these pages have any claim to originality, the compiler has drawn from an experience of no recent date in the general culture of flowers, during which he has paid particular attention to the Dahlia and Cactus. The favorable reception which, in the present enlightened state of horticulture, is extended to every consistent effort for the improvement of any of its departments, encourages him to send his little treatise to the press; and that it may have a tendency to strengthen the impulse already prevalent in the culture of choice flowers is his earnest wish.

May, 1839.

From the cactus section we quote:

CULTURE OF THE CACTUS

Most of the different varieties of the *Cactus* are natives either of the West Indies or South America, where the primitive kinds are found growing on and in the chasms of rocks, and on old dead wood, where they often subsist for months without water. Indeed, there are few tribes of plants that will live and endure so long a period of drought as the *Cactus* and its natural families of the *Aloe,* and those plants which are denominated *succulents,*—as nature seems to have purposely designed them to endure a recess of moisture, by their organization; being of a fat, fleshy texture, covered with a thick, tough, leather-like *coat* or bark, which does not respire, or at least admit of respiration so freely as deciduous plants; and hence, the plants being full of sap, or perhaps more properly a superfluous fluid, intended as a reservoir to sustain them when exigencies (as a long drought) require such provision; without which they could not subsist.

The natural habit of the *Cacteae* being a spinous and rough surface on almost every part of them, has in a great measure, hitherto deterred the lovers of flowers from bestowing that pains on their culture that other families of flowers, such as the *Camellia* and *Geranium* have received: but their beautiful flowers are beginning to attract the attention of amateurs, and it is little to be doubted that ere long the Cactus will become a general favorite of the green-house, parlor, and every department of floriculture.

The mode of cultivation is to obtain new varieties by *seeds* and cross impregnation, by mixing the pollen of one variety with another, by which the beautiful varieties of *Jenkinsonii, Ackermanii, Malisonia,* and many others (bearing the personal names of the lovers of the tribe) have been produced. The general mode of propagation adopted is, by cuttings of the leaf or stem of the plant, which in the *speciosa, Jenkinsonii,* and those kinds having joints, are cut at the joint; but those kinds which have long spaces between the joints, as the *speciosissima, cylindricus,* and the like tall growing kinds, may be cut into short pieces at the eye or bud. The preparing the cuttings of the Cactus for insertion into a compost for stricking, is something different from almost any other kinds of plants; which require the cuttings to be inserted shortly after being taken from the plants, that respiration may not too much exhaust the moisture in them, and which will in a great measure weaken their growth; whereas the Cactus, on the contrary, requires the cuttings to be laid on a dry shelf, or over the flue of a green-house, so that the wound may be contracted and dried up. This treatment is necessary to all kinds of succulent plants, to avoid their rotting off at the wound, if water is applied when potted. The cuttings being thus prepared, and the wound thoroughly dried up, (which will be in a week or ten days after their preparation,) they may be put into pots or pans in the usual manner of putting in cuttings.

The best compost for striking Cactus is 4-5ths of coarse sand and 1-5th of well rotted leaf mould, two or three years old; into which they may be inserted two or three inches deep. The cuttings being potted, they may be placed over the flue, or in any dry, warm part of the house, and slightly syringed of a fine sunny morning, or of an evening when the fire-heat is sufficient to dry the leaf in a short time; water lying long on the leaves in this process, in many cases rots the entire cutting; and most generally, at all events, it decays close to the surface of the soil in the pot. When the cuttings begin to root they may be moderately watered, and when sufficiently rooted, potted off in the following manner, for flowering plants.

The best compost for potting the cuttings or young plants of Cactus that I am acquainted with, is, about three parts of decomposed leaf mould, three or four years old, and one part of coarse sand. If a small portion of very fine ground bone dust is added, it will greatly facilitate the growth of the young plants. The method of potting is to prepare a quantity of well-broken potsherds, beaten very fine, which are to be put at the bottom of the pot, about an inch thick; the soil is then to be used by placing it lightly in the pots until they are about three fourths full; the plants are then to be taken gently from the pots with a sharp pointed stick, then to be placed on the surface, the roots spread in a regular manner, and earth closed over them sufficient to cover them to a proper depth. After potting off, two or three shiftings are required in this tribe of plants as in most others, when the pots are full of roots.

Mode of Culture.—The culture of the Cactus has been very much improved within a few years; indeed, the system has been entirely reversed from the former method of growing it in a dry, harsh, sandy soil or compost, to that of a light, rich soil, that shall be *porous* enough, with drainage to let off the superfluous water before it saturates and rots the roots, or the stem just above the surface of the soil;—hence, by the improved mode, this tribe of plants is grown and flowered in as good a manner and as large plants in one year as was formerly done in three or four. The present mode, then, consists in keeping the plants in a healthy growing state from the time they are first rooted as a cutting, until they are large enough for flowering plants;

when a different process is taken, *to check the flow of sap* and growth of the plant, in order to set the buds thickly on the leaves. Although the Cactus will do well in a green-house, and is by many growers considered as strictly a green-house plant, it does much better if managed as a hothouse plant, while in a growing state, at 60 degrees of fire heat in the winter quarters, as with proper management it may be kept in a growing state during the season. When grown in such heat, the plants should be syringed every other evening, in a moderate manner, so that the moisture may quickly dry up and not lie long on the leaves, which is very injurious to its health and well being. The watering may be done with the Cactus as with other plants, when in a growing state, namely:—whenever the earth is dry in the pots, it may be moderately refreshed with water, but care must be taken to do so in such a degree that the earth shall not be saturated so as to be always moist, and thus rot off the plant, as before hinted. In every other department of culture the Cactus requires good treatment until it is grown to a sufficient size for flowering, when an entirely different treatment may be given it. In the fall the plants intended for flowering may be placed on dry shelves in the green-house, where they are to remain without water, in order to set the flower-buds in a firm manner. The plants are to remain in this situation until New Year's, or even the beginning of March, when they are again to be taken into a warmer place, and treated in every manner as before directed for growing plants.

That a tribe of plants possessing the various traits of foliage, flowers, etc., that are natural to the Cactus, will at some future period engage much of the attention of the amateur and lover of flowers, cannot be doubted: for although in regard to appearance of foliage they cannot be said to vie with the *Camellia* and many other families that find a place under glass during the winter, yet there is a beautiful natural order in their nerves, and the spines or armature with which nature has endowed this family of plants, with which to guard against the intrusion of animals and other invaders, that most generally, when once made acquainted with their prickly coats, they are careful how they again come in contact with so formidable a tribe of the vegetable kingdom. Indeed, in many cases, the tall growing kinds of Cactus and the American Aloe are used to guard off cattle, and as a barricading division of lands.

The flowers of most kinds of the Cactus are generally a recompense for their plain appearance of foliage, for in many cases they are beautiful, and mostly pretty. Their color is of many hues, from that of a bright scarlet, as in the *speciosissima,* to a beautiful white or cream color, as in the *grandiflorus,* or night-flowering varieties. In order to give some explanation of the color and habit of the plants of this natural family, I shall preface the descriptive list to follow, with the natural ports and habit of the different sections of the family, by giving a full description of a natural plant in a growing state, which may be considered as a type of each section in order, as they follow the different divisions. In order to facilitate this end, I shall use such terms as seem to be the most intelligible to the general reader. In this case I must, therefore, in a measure deviate from the general rules of terminology of botany; which will, I hope, be considered as no intrusion on the science, more particularly when it must be evident that the tenor of this book is to lend some aid to those who are desirous to become acquainted with the culture and beauty of this family of plants.

CULTURE OF THE CACTUS IN ROOMS

The Cactus does admirably well in the parlor or warm dry rooms, dry heat agreeing better with the Cactus than almost any other tribe of plants; but care must be taken that they are not allowed to be frozen; for if this once happens, it is certain death.

The management is simply this. In the winter months, keep the earth moderately dry, and at no time over-water them, as this is the season for them to lie dormant and form their flower-buds. When the spring advances, about the first weeks in April more water may be applied and the roots kept moderately moist, but not too wet. The situation chosen should be where they may receive a full share of the sun, and if possible in the warmest part of the room. The guide given for the green-house, will answer, in every particular, for the parlor.

GRAFTING THE CACTUS

The grafting of the weaker kinds of the Cactus on the gross growing ones, is now becoming very general among amateurs, as that of engrafting the *truncatus* on the *Napoleonis* and *the triangularis.*

The operation is performed in various ways, as by taking off the stalk to be grafted, transversely, and inserting the graft by making an incision into the stem, with the point of the knife downwards, in the angle. The cutting is prepared by cutting off a joint of the plant, and paring off each side of the bark in the form of a wedge. The graft is then inserted in the incision and the cavities closed up with wax, tallow, or other pliable substance, to keep out the wet and air from the part where the scion and stalk are united.

GENERAL OBSERVATIONS

I think it may be confidently asserted, that this beautiful tribe of plants will ere long become a favorite with the parlor connoisseur; for certain it is that many varieties produce flowers that will compare in delicate and rich colors with the most choice plants of the green-house or parlor. The great objection to the Cactus has been, the monotony of the appearance of the whole tribe, as their habit is such that the trunk, branches and leaves are all similar in surface and armature. But if this tribe does not engross our attention with lively and vivifying shades of green foliage, as the Camellia, and many other families of plants, the inquiring observer may realize a natural lesson from its peculiar habits, of the most satisfactory and pleasing nature.

The family of Cactus may be considered as the "armed part of the vegetable kingdom;" for most plants of this kind are covered with spines or *aculei* on the surface of their leaves, which are a safeguard and protection from the intrusion and damages of the animal kingdom. Taking this beautiful economy of nature into consideration, the attention of the most superficial observer must at once be absorbed in its utility; for without such protection, so fragile and brittle is the whole family, that the least intrusion of the wild animals of its native country would not only mutilate, but entirely destroy the whole plant. Allowing this economy in the structure of the Cactus, let us now examine the many variations and shapes of its peculiar habits. Some we find are of an erect and stately habit, as the *albiflorus* and *peruvianus;* these are entirely contrasted by those of a pendulous habit, as the *flagelliformis,* hanging down in so fragile a manner, whilst others take an intermediate stature, of a branching nature, as the *C. speciosissimus,* etc., natural to them: hence, while one variety of this family grows erect, the other, on the contrary, descends. In

addition to these contrary positions, we are presented with a medium habit in the *speciosus, Jenkinsonii, Ackermanii,* etc., which branch out in a regular manner from their side shoots, which are, generally, flat-leaved, trunks margined with indentations, like the teeth of a saw,—similar to the Cactus *Jenkinsonii, extensis,* and like similar characters. There is also a nice and natural regularity of the different spines, which are in dotted tufts over the surface of the leaves, of different colors—some black and some yellow. The *Opuntia microdasis* is a beautiful specimen of foliage, being tufted over with regular rows of yellow spines on a beautiful green color. Others, as the upright growing kinds, have regular rows or lines of spines of five, six, or seven angles; and some, as the *Opuntias,* are irregularly dotted over the flat leaves.The flowering is also various; as some open only of a night, as the *C. grandiflorus* and *C. triangularis;* the latter plant has been flowered lately at the fine establishment of Mr. Cushing, Belmont place, by Mr. Haggertson, and was certainly a splendid specimen of so rare a flower. To these may be added those which flower in the day, as the *C. speciosissimus, Jenkinsonii,* and many other beautiful varieties. Indeed, there is not a plant among them but deserves culture and the best attention of the amateur and florist.

I quote the following article from M'Intosh's beautiful work on the Green-House, which I hope will be useful in this place.

TREATMENT IN THE HOUSE

"Succulent plants, so far from requiring the temperature of a stove, as erroneously supposed by many, are most certainly much more injured by too high a temperature than by being kept too cool. If we except the genera *Stapelia* and *Euphorbia,* and a few of the *Cacteae,* all others are much better when kept in a cool, dry, airy greenhouse, than any where else; nay, a cold pit, if not in a damp situation, will be a very proper habitation for many of them; and not a few, particularly of the families *Sempervivum* and *Mesembryanthemum,* stand in the open borders of our gardens during the most rigorous frosts with which we have of late years been visited, with the exception of the winter of 1837-8.

Another very erroneous notion, which till of late has very generally prevailed, is, that succulents should be planted in lime rubbish, gravel, or similar porous matter, with a view to prevent them from growing too rapidly, and also, that they should scarcely have any water given to them. The truth of the matter is, that this singular and interesting tribe of plants have been long neglected in this country, and placed in situations in the green-house where little attention has been paid to them; and many of them, notwithstanding this treatment, have continued to live thus disregarded and unnoticed, till their splendor, or the fragrance of their bloom, arrested, for a time, the attention of the owner: then they may have been brought into a more favorable situation till their flowers had faded, when, for the most part, they were consigned again to their old situation. Plants requiring so little attention as this to keep them in existence, and the only fear of losing them being from an excess of damp, led the indolent gardener to plant them where they were not likely to suffer from this cause, and at the same time rid himself of the trouble of attending to them.—Plants may exist for a long time under very bad treatment; but plants so circumstanced cannot be expected to flower well, or to attain any very extraordinary habit, either of beauty or singularity. But the same species of plants, treated in a more rational and favorable manner, will develop all their beauties and singularities to us in return.

Succulent plants, in general, do not require much water during winter, when they are in a dormant state; but during spring and summer, when they are growing vigorously, they require as large a share of that element as any other plants (not exactly aquatic). During winter, care must be taken that they are not overwatered, and also that the house that they are grown in is water-tight, for many of the more delicate would suffer if rain drops were to fall into their centre, and more particularly those that are kept in a low temperature. A good way to supply many plants of this description with water is, by standing the pots in pans of water; but this is only to be understood as applicable to the most robust-growing sorts during spring and summer; and to the more delicate ones occasionally. During spring and summer, they may be syringed over their tops once or twice a week; but during autumn and winter, this should be discontinued.

Air cannot be too freely admitted to them at all seasons, both in winter and summer; and during the latter period, the side lights of the succulent house, at least that portion of it dedicated to the families *Sempervivum, Crassula, Mesembryanthemum,* etc., should be altogether removed: that portion in which *Stapelia, Cacteae,* etc., are kept, should only be thus openly exposed in very warm days; but a partial degree of ventilation must be given them upon all fitting occasions.

A watchful eye must be kept that the smaller and more delicate do not suffer from damp, and that cuttings of those apparently likely to die or become unsightly be put in, for many of the more curious are not long-lived. Frequent cleaning the surface of the mould in the pots; examining them minutely for the detection of insects, which they are liable to, particularly the scale, white bug, and green fly; rubbing off the former with a sponge and soft soap, washing the second off with clean water applied by the engine, and using tobacco smoke, or Scotch snuff sprinkled over them, when damp from previous watering, will completely rid them of these enemies.

There are two curious and often fatal diseases to which succulent plants are subject, particularly the genus *Opuntia,* and some other of the *Cacteae;* and these are admirably described by M. Thiery de Menonville, who travelled, many years since, through the Spanish settlements of South America. These diseases are termed by him the gangrene and *la dissolution.* The former of these is of frequent occurrence, beginning with a black spot, which spreads till the whole plant ultimately dies. The latter disease is very appropriately called *la dissolution,* and is much more serious in its effects than the former: it is described by the late eminent Sir James Edward Smith, in "Introduction to Physiological and Systematic Botany,' as follows:—'This seems to be a sudden decay of the vital principle, like that produced in animals by lightning or strong electricity. In an hour's time, from some unknown cause, a joint, a whole branch, or sometimes an entire plant of the nopal (the Indian name for the *Opuntia cochinillifera* or Indian fig), changes from a state of apparent health to a state of putrefaction or dissolution. One minute its surface is verdant and shining; the next it turns yellow, and all its brilliancy is gone. On cutting into this substance, the inside is found to have lost all cohesion, being quite rotten. The only remedy in this case is speedy amputation below the diseased part.' Both these diseases are not unfrequently observed in collections in this country, and if the former be not arrested in its progress by amputating the branch upon which it appears before the disease has extended too far, the consequence would be the loss of the plant in a day or two.

Some of the continental cultivators of these plants

have grown them to a large size within a short space of time, excluding the air by placing a tall, bell-glass over the plant supplying it with abundance of water and heat in the stove, and also by placing them in a very warm hot-bed; thus stimulated to the utmost extent, the plant swells out to a large size; but care must be taken that this humidity be not carried too far, for fear of rotting the plant.

In regard to temperature, most succulent plants will stand uninjured when the thermometer falls to forty-five degrees, or even lower, but many of them will also stand several degrees of frost with impunity. Excepting the *Cacteae, Stapelia,* and *Euphorbia,* all other succulents are rather injured by artificial heat than benefited. They will stand any degree of sun heat, but fire heat is a very different thing.

The late Mr. Haworth, in his 'Supplementum Plantarum Succulentarum,' speaking of the culture of succulent plants, transcribes the following passage from Miller, a passage which, he says, 'is worthy of being recorded in letters of gold; and more especially,' he adds, (and we may add so also) 'as the truth it inculcates, or rather complains of, still continues to exist.' The quotation alluded to is to the following effect: 'At which time (October) you should remove them (the succulents) into the conservatory, placing them as near the windows as possible at first, letting them have as much free open air as the season will permit, by *keeping the windows open* whenever the weather is good. And now you must begin to abate your waterings, giving it to them sparingly; but you *should not suffer the leaves to shrink for want of moisture,* which is another *extreme* some people run into for want of a little observation; for when they are *suffered to shrink* (not die gradually away) for want of *sufficient moisture to keep their vessels distended, they are rendered incapable of discharging this moisture whenever they receive it again.*'

'I humbly hope,' adds Mr. Haworth, 'this golden passage from our great horticulturist will have more effect over those who read it, than all my own feeble pen has heretofore stated to the same effect. For, at this enlightened period, it requires but a moderate share of philosophy to allow that air and exercise, and a due supply of warmth and food, are all essential requisites towards the healthful support of every organised being, whether of the animal or vegetable kingdom. And air and the rustling winds are the exercise of plants; and humidity and water are at least the vehicles which convey their food; and warmth the medium which adapts them to receive it in a salutary way; although the degree of warmth actually requisite is as different for the different species as the different climates over which the Creator has been pleased to distribute them,—by no means at random, but all in harmoniously beautiful order. And those which it has pleased their great Architect to place in equinoctial latitudes appear to be more adapted to the reception of nutriment above ground, by absorption from the air, in the dewy places of their nativity, than those whose absorbing orifices are less capaciously expanded in more temperate countries; or in those still more chilly regions which approach the confines of perpetual snow. There the great business of nutrition appears to be almost wholly from the root. And hence, perhaps, the impatience which Alpine plants evince to heat, which actually exhausts and overpowers them.

'O Jehovah! in sapientia ea fecisti.' "

A LIST OF CACTUS

At Mr. S. Sweetser's, Cambridgeport, 1839

Echinocactus
- Ottonis
- Multiplex

Echinocactus—*continued*
- crenatus
- eyriesii

Cereus
- aurantiacus
- Caeruleus
- coccineus
- costus minor
- cylindricus
- Chiloensis
- Desvauxii
- extensis
- fimbriatus
- flagelliformis
- grandiflorus
- ignescens
- Jenkinsonii
- longiflorus
- Malisoni
- marcrantianus
- Monstrosus
- Mayfly
- Napoleonis
- Pitajaya
- alba florus
- squamulosus
- Smithii
- triangularis
- Vandesi
- Peruvianus

Epiphyllum
- Ackermannii
- alatum
- crispatum
- Hithenii
- speciosum
- truncatum

Opuntia
- vulgaris
- rosea
- spinosissima
- glauca
- curssavia
- fragilis
- truncata
- Brasiliensis
- cochinillifera
- microdasis
- spinosissima minor
- discolor
- pulsilla

Pereskia
- aculata
- grandiflora

Rhipsalis
- salicornoides

LINNAEUS vs. LINNE

DEAR EDITOR:

Sometime ago a questioner asked Mr. Haskins in the "Arizona Republic" about "Linnaeus" and enclosed copy is an answer to my letter correcting Mr. Haskins, and I am surprised to see this great mistake committed in one of your books because I was almost willing to bet that the prominent botanists of U. S. would not allow themselves to make such a great mistake—although it is committed in Encyclopedia Britannica. The name Carolus Linnaeus is dead and buried since (if I remember correctly) 1757 when he was admitted to nobility and the name changed to Carl Von Linné', and under this latter name he is registered in the Swedish noble house, and under this latter name he is buried, and "Carl Von Linné' " is cut into his monument erected to his memory in Stockholm, Sweden. Wherever a monument is erected to his memory, "Carl Von Linné' " is cut into it, as for instance in Chicago, Illinois. The name Carl Von Linné' is taught in all the schools in Europe and under this name he is spoken of among the scientists "over there."

GUSTAF STARCK.

Carl Linné, later Carl Von Linné, was a surgeon who took great interest in botany and proposed the binomial system of nomenclature in his *"Species Plantarum"* (1753).

Although a Swede, he wrote his books in Latin as this was and is the accepted language of science. His books are signed by him in the Latinized version of his name Carolus Linnaeus.

The work on which his fame today is founded therefore is *"Species Plantarum* by Carolus Linnaeus."

In Sweden it is presumed that he is best known by his native name of Carl Von Linné, but by the scientific world he will always be Carolus Linnaeus, the father of systematic botany. W. T. M.

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